APPENDIX F. USER INSTRUCTIONS FOR NES AND NPV SPREADSHEET

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APPENDIX F USER INSTRUCTIONS FOR NES AND NPV SPREADSHEET

F.1 INTRODUCTION

The results obtained in this analysis can be examined and reproduced using the Microsoft Excel® spreadsheet available on the U.S. Department of Energy Building Technologies website at: http://www.eere.energy.gov/buildings/appliance_standards/commercial/packaged_ac_hp.html

The spreadsheet is called "PTAC-PTHP_NIA_NOPR_03-14-2008.xls" and it enables the user to perform NES analyses of up to four equipment classes of packaged terminal air conditioners (PTACs) and packaged terminal heat pumps (PTHPs). Standard size PTAC and PTHP equipment is further divided into two representative capacities, making a total of six representative capacity of equipment. To execute the spreadsheet requires Microsoft Excel® 2003 or a later version.

F.2 USER INSTRUCTIONS FOR NES AND NPV SPREADSHEET

The NES spreadsheet performs calculations to forecast the change in national energy use and net present value due to an energy conservation standard for PTAC and PTHP equipment. The energy use and associated costs for a given standard are determined first by calculating the shipments and then calculating the energy use and costs for PTAC and PTHP equipment shipped under that standard. The differences between the standards and base cases can then be compared and the overall energy savings and present values determined. The NES spreadsheet or workbook consists of the following worksheets:

Table F.2.1 Description of Tabs in NES and NPV Spreadsheet

Supplemental Table on Shipments	The Supplemental Table on Shipments contains detailed forecasts of base case shipments of PTACs and PTHPs by equipment class, capacity and efficiency level for selected years
Shipments	The Shipments Table contains a summary of the shipments by equipment class and capacity for selected years and cumulative from 2012-2042
Shipments-Weighted Data	The Shipments-Weighted Data sheet contains calculated tables of both input data and results from the spreadsheet.
Summary of Results	The summary of results contains user input selections and for the selected equipment class a Summary table, Shipments graph, Cumulative Energy Savings and NPV graph, and an Annual Non-Discounted Savings Trend plot, which also contains a plot of discounted net savings by year.
Savings Summary	A bookkeeping table used to store the results of the shipments and energy savings calculations for an individual equipment class and up to five candidate standard levels (e.g., Levels 1-5).
Details_Save	An accounting worksheet used to tally the energy and cost savings year by year for an individual equipment class and standard level. The energy and cost savings in a single year are the difference between the base case energy use and costs for that year and the standard level energy use and cost
Details_Stock	A worksheet that keeps track of all surviving stock of PTAC and PTHP equipment in a equipment class from the start year forward. Stock is updated for each year.
Initial Stock Details	A worksheet that keeps track of all surviving stock of PTAC and PTHP equipment in a equipment class from 2006 to the start year of the forecast. Stock is updated for each year.

Table F.2.1 (cont'd)

Supplemental Table on Shipments	The Supplemental Table on Shipments contains detailed forecasts of base case shipments of PTACs and PTHPs by equipment class, capacity and efficiency level for selected years
Shares Output 1, Shares Output 2, Shares Output 3, Shares Output 4	Four worksheets that estimate percentage distribution shipments by efficiency level and year of all equipment classes of PTAC and PTHP equipment from the start year of the forecast forward. Each worksheet applies to a different type of business
Shares Processing	Worksheet that performs the detailed calculations based on annualized cost to estimate market shares of an equipment class of PTAC and PTHP equipment by efficiency level in a business type based on risk preferences of purchasers for a baseline
Input	Worksheet that performs detailed calculations by risk preference class to estimate annualized cost for a newly purchased unit of a equipment class of PTAC and PTHP equipment by efficiency level in a business type.
PTAC Cost List	Contains input data on installed cost (total price), repair and maintenance cost, and annual electricity cost for units of PTAC and PTHP equipment, calculated by the LCC model by equipment class, business type, and efficiency level at U.S. average conditions
Details_ Ship	Calculates total shipments by efficiency level for an equipment class by year, given a candidate standard level. Also contains market weighted-average percentages of shipments by efficiency level of each equipment class of new PTAC and PTHP equipment
Initial Shipments Detail	Calculates total shipments by efficiency level and market weighted-average percentages of shipments by efficiency level of each equipment class of new PTAC and PTHP equipment for baseline market conditions and up to 5 candidate standard levels.
Shipments_Summary	Contains estimates of shipments of an equipment class of PTAC and PTHP equipment by efficiency level and year, given a candidate standard level. Also contains estimates of total shipments of each equipment class by year for each candidate standard level.
Base Product Market Share Calcd	Worksheet performs calculations to estimate total market shipments by equipment class and year in the base case.
Product Shares	Contains equipment class percentages of overall PTAC and PTHP equipment shipments.
Economic Trends	A worksheet that contains historical and projected economic values as well as shipments data. This worksheet receives data from a separate forecast worksheet called "Shipments Calculations."
Com	Estimates of commercial building stock increases, decreases, and surviving stock by year and building type from AEO 2006.
Com BEAMS	Extra background calculations on building stock.
Marginal BTU Conversion Rate	A worksheet that contains data on the marginal conversion rates from site electricity consumption to primary (source) energy required to generate, transmit, and deliver electricity to the end user
Equipment Parameters	A worksheet that contains the economic, energy, and size parameters for PTAC and PTHP equipment and other equipment parameters used to project survival and calibrate the model.
Labels	This is used as an interface between user inputs and the rest of the worksheets -- do not modify this sheet.

Basic instructions for operating the NES spreadsheet are as follows:

1) Once the NES spreadsheet file has been downloaded from the Web, open the file using Excel. You will be confronted with a dialog box as the file opens. You DO want to Enable Macros (Select "Yes" when this option is presented.) At the bottom, click on the tab for the worksheet Summary of Results.

2) Use Excel's View/Zoom commands at the top menu bar to change the size of the display to make it fit your monitor.

3) The user can change the model parameters listed in the gray box labeled "User defined inputs". The parameters are:

   a. Equipment Class and Capacity: To change the value, select the menu box. A drop-down list appears. Select the desired equipment class. Many of the potential classes have no shipments; i.e. they are not "real." If the user selects one these classes, the first row in t

   b. Std Level: Selects the standard level used in the non-discounted annual net impacts figure. Must be less than or equal to the Max Tech level. If a higher standard level than Max Tech is selected, no results will be available for the levels above Max Tech

   c. Max Tech: To change the value, select the Max Tech box . A drop-down menu pops up. Select the desired type of maximum technologically feasible efficiency level (usually Level 5). The Max Tech should be selected for the equipment class that was analyzed in the LCC analysis. If a Max Tech level is selected that is beyond the Max Tech level identified in the LCC analysis, the model will produce impacts for the (extra) incorrect efficiency levels, but they will not be valid.

   d. Growth in Energy Prices: To the change value, select the Growth in Energy Prices box. A drop-down menu pops up. Select the desired Growth level (Constant, Reference, Low, or High). The scenarios refer to EIA projected rates from AEO 2007.

   e. Standard First Year: This is the first year in which the standard will take effect. This should be set to 2012 for the NOPR.

   f. Discount Rate: To the change value, select the Discount Rate box. A drop-down menu pops up. Select the desired Discount Rate.

4) Once the user parameters have been reset the model must be re- run. To re-run the model press the green "Update Values" button. Note: The output values are not correctly updated until the "Update Values" button is pressed. To run all cases and update the summary information in Sales-Weighted Data sheet, press the "Run All Cases" button. The model will take about ten minutes to rerun all cases.

5) If a new set of LCC results has been loaded into the PTAC Cost List and Equipment Parameters sheets, it will be necessary to recalculate the baseline equipment shipment shares by efficiency level in sheets Output1-Output4. To do this, press the "Shares Processing" button. The shares automatically update, and it will not be necessary to update again unless LCC input data change.

6) Tabular results are presented to the right of the "User defined inputs" box for the base case (Level 1) and the Level 2 through Level 8 standards cases. Tabular results are summarized as: 1) cumulative shipments, 2) percentage change in total shipments as efficiency level increases (currently, this does not change), 3) present value of national equipment cost savings in billions of dollars, 4) present value of national operating cost savings in billions of dollars, 5) national net present value in billions of dollars, and 6) cumulative national energy savings in quadrillion Btus. Results for all standards cases energy savings are tabulated for two periods: 2012 to 2042, and 2010 to 2062. Net present value results are tabulated for 2012-2062.

   Graphical results are presented for the main tabular results. Two charts are provided for the given model parameters: 1) shipments forecasts for the base case and all standards cases and 2) national energy savings and net present values for all the standards cases.

   For a given set of user defined parameters, the user can also view the annual trend in the non-discounted net impacts for an individual standard level. To view an efficiency level select Std Level, and then select a standard level from the drop-down list.